VERNAL POOL

Concept: Vernal Pools are herb-dominated depressional wetlands with reliably short hydroperiods, which contain wetland plants absent in surrounding communities but lack indicators of deeper water and longer hydroperiod. These communities generally completely fill shallow depressions. The Typic Subtype covers most examples in North Carolina, all those that don't meet the criteria for the specialized Sphagnum Subtype. There may be a need for further breakdown of this group, but the basis for doing so is unclear at present.

Distinguishing Features: Vernal Pools are distinguished from other depressional wetlands by the absence of plants associated with longer hydroperiods and the presence of plants intolerant of long inundation. Typical plants include *Panicum virgatum, Erianthus giganteus, Carex glaucescens, Aristida virgata, Woodwardia virginica, Aristida palustris, Schizachyrium scoparium*, and any of several *Andropogon* species. Marsh and pond species, such as *Hymenachne hemitomon, Rhynchospora tracyi, Rhynchospora inundata, Rhynchospora careyana, Leersia hexandra, Coelorachis rugosa, Diodia virginiana, Rhexia aristosa*, and *Juncus repens* are generally absent. (These species may become scarce in wetter communities during drought.) *Centella asiatica, Kellochloa (Panicum) verrucosa, Lachnanthes caroliniana, Eleocharis tricostata*, and *Coleataenia rigidula* may be present in small numbers, in wet microsites, or during unusually wet periods but are not generally abundant. Vegetation resembling Vernal Pool may occur on the upper edges of some deeper ponds, but only expanses that cover a significant part of a basin or that cover a substantial area in a larger basin should be considered this type.

Synonyms: *Panicum virgatum - Andropogon (capillipes, glaucopsis) - Aristida palustris* Herbaceous Vegetation (CEGL004100). Small Depression Pond (3rd Approximation - outer zone). Ecological Systems: Southern Atlantic Coastal Plain Depression Pondshore (CES203.262).

Sites: Vernal Pools occur in limesinks, swales in relict dune systems, and other shallow basins with short hydroperiods.

Soils: Soils are sandy, loamy, or clayey mineral soils. Examples are small enough that they are treated as inclusions in upland soil units in soil surveys.

Hydrology: Surface water is shallow to moderate, usually a few inches to a couple feet deep. Standing water seldom persists far into the growing season, and water may be absent in drier winters.

Vegetation: The vegetation is dominated by graminoids, which may be fairly sparse but usually are moderately dense. The most characteristic species, highly constant and often dominant, are *Panicum virgatum* var. *cubense*, and *Andropogon* spp. The *Andropogon* are variously identified as *virginicus, glaucopsis, capillipes*, or *dealbatus*. Other frequent species in CVS plots and site descriptions include *Centella asiatica, Anchistea virginica, Carex glaucescens, Erianthus giganteus, Aristida virgata*, and *Lachnanthes caroliniana*. Other less frequent but sometimes abundant herbs include *Juncus scirpoides, Juncus pelocarpus (abortivus), Euthamia caroliniana, Dichanthelium ravenelii, Pluchea baccharis, Drosera capillaris, Aristida palustris, Eupatorium*

leucolepis, Eupatorium mohrii, Dichanthelium wrightianum, Proserpinaca pectinata, Eleocharis tricostata, Kellochloa verrucosa, Muhlenbergia torreyana, Rhynchospora filifolia, Rhynchospora chalarocephala, other *Rhynchospora* species, and *Sphagnum* sp. Species shared with wet longleaf pine communities, such as *Polygala lutea, Rhexia alifanus, Rhexia nashi, Eupatorium leucolepis, Lobelia nuttallii, Sorghastrum nutans, Lycopodiella alopecuroides*, and others, may be present with low constancy. A few shrubs and vines may be present, most frequently *Smilax rotundifolia, Smilax walteri, Smilax laurifolia, Ilex glabra, Lyonia mariana*, and *Ilex mytrifolia*. At least a few stems of *Nyssa biflora* often are present, and *Pinus taeda, Pinus serotina, Magnolia virginiana,* or other trees may be present.

Range and Abundance: Ranked G2? In North Carolina Vernal Pools are clustered in the Sandhills region and in limesink complexes in the southern part of the outer Coastal Plain. The synonymized association ranges from North Carolina to the Gulf Coast states. Its distribution on the Gulf Coast appears uncertain. If it is abundant there, it may be less rare than G2. Vernal Pools appear to be sometimes overlooked or not emphasized in site reports in North Carolina.
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Associations and Patterns: Vernal Pools may fill entire small basins or may occur as a broad edge zone in larger depressions. Small Depression Shrub Border may be present as an outer zone around them. They often occur in in limesink clusters or relict dune systems complexes with other Coastal Plain Depression Communities nearby, particularly Small Depression Drawdown Meadow and the various subtypes of Small Depression Pond. The surrounding matrix is usually Wet or Dry Longleaf Pine Communities.

Variation: Variation is not well known in this community, but two variants are provisionally recognized, based on geography and floristic differences, though in need of further clarification:
1. Sandhills Variant occurs in the Sandhills Region. Species more likely to be found in it include *Anchistea virginica, Carex glaucescens, Eleocharis tricostata, Rhynchospora torreyana, Aristida virgata,* and *Erianthus giganteus*.
2. Coastal Plain Variant occurs in the outer to middle Coastal Plain. Species more likely in it include *Centella asiatica, Lachnanthes caroliniana,* and *Drosera capillaris*.

Dynamics: Vernal Pools demonstrate variation in response to changing water levels as other herbaceous Coastal Plain Depression Communities do. Because their typical hydroperiod is shorter, dry spells have less effect on them than wet periods. In dry periods, upland plants may establish there. In wet periods, at least those that are associated with wetter communities may see *Hymenachne hemitomon* and other more water-tolerant species spread into them.

Natural fire would be more frequent in Vernal Pools than in wetter depressions, since they are more likely to be dry when the surrounding areas burn.

Comments: The Fourth Approximation Guide included a Sphagnum Subtype of Vernal Pool as well as a Typic Subtype. This subtype has been dropped. It is equivalent to the NVC's *Sphagnum cuspidatum* Nonvascular Vegetation (CEGL004384) and is described as having very little vascular vegetation but is not otherwise well described. For the Fourth Approximation, it was conceived as being a drier analogue of Small Depression Drawdown Meadow (Boggy Pool Subtype). However, no examples have been identified. It appears reasonable that the greater frequency of

fire in drier depressions would prevent persistence of a moss layer. All *Sphagnum*-dominated depressions that have been found to have substantial presence of *Anchistea virginica, Carex striata,* or other vascular plants. They appear wetter than typical Vernal Pools and appear to fit the concept of Small Depression Drawdown Meadow. However, the possibility of finding a *Sphagnum* community that fits within the Vernal Pool concept should be remembered.

Rare species: Vascular plants: *Lobelia boykinii, Ludwigia linifolia, Muhlenbergia torreyana, Panicum tenerum, Rhexia aristosa, Rhynchospora pleiantha, Sagittaria isoeteformis, Scleria retricularis,* and *Stylisma aquatica*.

Vertebrate Animals: *Ambystoma tigrinum, Rana capito,* and *Triodopsis soelneri*.

References: